REMARKS

Claims 1-15, 17-22 and 24-29 are pending in the present application. Claim 23 was cancelled without prejudice. Claims 1-2, 17-18, and 20-22 were amended. New Claims 24-29 were added. Support for these claims can be found generally throughout the specification, and in particular on pages 2-4 and 11-21. No new subject matter has been added by the amendments or additional claims. Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and the following remarks.

I. Prior Art Rejections:

Claims 1-15 and 17-23 stand rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 5,698,322 to Tsai et al. (hereafter "Tsai '322"), in view of U.S. Patent No. 5,976,694 to Tsai et al. (hereafter "Tsai '694"). Applicants respectfully traverse this rejection for the following reasons.

To establish a prima facie case of obviousness, the Examiner must establish that a prior art reference, or combined references, teach or suggest all the claim limitations of Applicants' invention. MPEP §§ 2142-2143. Also, the teaching or suggestion to make the claimed combination, and the reasonable expectation of success, must be found in the prior art, and not based on Applicant's disclosure. See MPEP § 2142; *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). There must be a reason or suggestion in the art for selecting the procedure used, other than the knowledge learned from Applicant's disclosure. *In re Dow Chem. Co. v. American Cyanamid Co.,* 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1529-32 (Fed. Cir. 1988). Using Applicants' disclosure as a blueprint to reconstruct the claimed invention from isolated pieces of the cited art contravenes the statutory mandate of §103 which requires judging obviousness at the time the invention was made. *See Grain Processing Corp. v. American Maize-Prods. Co.,* 840 F.2d 902, 907, 5 U.S.P.Q.2d 1788, 1792 (Fed. Cir. 1988).

Currently pending Claim 1 is directed to a biodegradable nonwoven web comprising a first biodegradable binder fiber that does not undergo severe heat shrinkage, and a second biodegradable thermoplastic fiber. The web has a moderate permeability within the range of about 500 to about 1500 μm^2 and a high void volume that is greater than about 25 cm^3/gram. The biodegradable nonwoven web is thermally bonded at a temperature within about 20°C above

the melting temperature of the first biodegradable binder fiber, using only convective heating to achieve the moderate permeability and high void volume. Support for Claim 1 can be found throughout the specification, and particularly on pages 2-4, 13-15 and 18-21.

The Tsai '322 reference is co-owned by the Assignee of the present invention. This patent is directed to multicomponent fibers, wherein one component forms an exposed surface capable of thermally binding the multicomponent fiber to other fibers. The Tsai '694 reference is co-owned by the Assignee of the present invention. This patent is directed to thermoformable ion-sensitive compositions having improved processability. Dr. Fu-Jya Tsai is a common inventor in these two references and the claimed invention. Applicants respectfully submit that the neither Tsai '322 nor Tsai '694, nor the combination of these references, teach or suggest Applicants' invention as recited in Claim 1. These references, alone or in combination, do not teach or suggest a biodegradable nonwoven web comprising a first biodegradable binder fiber that does not undergo severe heat shrinkage, and a second biodegradable thermoplastic fiber, and wherein the web is thermally bonded at a temperature within about 20°C above the melting temperature of the first biodegradable binder fiber, using only convective heating, to achieve a moderate permeability and a high void volume.

Applicants respectfully submit that Tsai '694 does not teach convective bonding below 160°C, without an additional bonding component, such as a pressure or an adhesive component (see column 12, lines 33-35). Tsai '694 teaches air bonding the fibers using a Dan-web machine. The Dan-web process involves a heated calender to bind the fibers in the nonwoven structure. Tsai '694 does not teach a bonding process that does not use a pressure component. The webs disclosed in Tsai '694 are thermally bonded under heat and pressure, using thermal calendering, a form of conduction heating. The thermal calendering applies both heat and pressure to bond the web. In addition, the webs in Tsai '694 are bonded using a WDF-02 binder fiber that contains an adhesive component within the fiber. Both the pressure component and the adhesive component aid in the bonding of the web. Pressure and/or adhesive applied to the web results in a tighter, more compact structure, and this in turn, results in a lower void volume of the bonded web. Applicants' nonwoven webs, as recited in Claim 1, are not bonded using an additional pressure or adhesive component, but are only bonded using

convective heating. The webs disclosed in Tsai '694 are formed using processing parameters that differ from Applicants' claimed invention.

Applicants respectfully submit that the bonding temperature is not an inherent property of a binder fiber. Bonding temperature also depends on processing parameters, such as process speed, fiber length and additional pressure and adhesive components. These parameters are independent of the melting point of the binder fiber. Conventional bonding processes run at temperatures significantly above the melting temperature of the binder fiber to ensure that a thoroughly bonded, strong web results. For example, the T-255 bicomponent binder fiber has a sheath melting temperature of about 128°C and a recommended bonding temperature of 165°C, a temperature differential of 37°C. The WDF-02 binder fiber has a softening point (onset of melting point) of about 210°F (99°C) and a vendor recommended running temperature (bonding temperature) of 375-395°F (191-202°C). This represents at least a 92°C temperature differential. In addition, the FiberVisions polypropylene/polyethylene binder fibers have a melting point of about 130°C and a recommended bonding temperature of 170°C, a temperature differential of 40°C. All of these bonding temperature recommendations were made by technical experts in the field.

Conventional bonding processes that that run at temperatures closer to the melting temperature of the binder fiber used an additional bonding mechanism to achieve a thoroughly bonded, strong web. There is nothing in Tsai '694 or Tsai '322 that teaches or suggests a convection bonding at low temperatures without an additional bonding mechanism. Tsai '322 does not teach or suggest any web processing parameters. Furthermore, inherency is immaterial if one of ordinary skill in the art would not appreciate or recognize the inherent result. *In re Rijckaert,* 9 F.3d 1531, 1533, 28 U.S.P.Q.2d 1955, 1957 (Fed. Cir. 1993). The melting temperatures taught in Tsai '322 cannot be used, as hindsight, to infer the bonding temperature of Applicants' webs. At the time of Applicants' invention, one skilled in the art did not appreciate or recognize that Applicants' webs could be bonded at low temperatures relative to the binder, without an additional bonding mechanism. Moreover, obviousness is lacking when the state of the art at the time of the invention, points researchers in a different direction than that which the inventor proceeded. *See In re Hedges,* 783 F.2d 1038, 1041, 228 U.S.P.Q. 685, 687 (Fed. Cir. 1986). Thus, Tsai '694 points in a different direction, or teaches away, from web bonding using

only convective heating at low temperatures, since this reference teaches the conventional use of both a pressure and an adhesive component to bind its webs.

Applicants respectfully submit that the nonwoven webs formed by the combined Tsai '322 and the Tsai '694 references would not inherently possess the structural, biodegradable and fluid properties of Applicants' claimed nonwoven webs. Tsai '322 does not teach or suggest any processing parameters. The nonwoven structures disclosed in Tsai '694 are formed using conventional processing parameters that differ from Applicants' claimed invention. The combination of Applicants' materials and processing parameters create a strong web with unique fluid properties, not taught or suggested by these references.

Applicants also respectfully submit that unexpected properties support a conclusion of nonobviousness. MPEP §2144.08. As set forth in the pending claims, the webs have a high void volume with a moderate permeability. As would normally be expected to one of ordinary skill in the art, an increase in void volume would increase permeability, while a decrease in void volume would decrease permeability. However, the present invention is able to achieve a high void volume while keeping a low to moderate permeability. These fluid properties are unexpected, patentable features of the nonwoven webs, as recited in Claim 1. Applicants respectfully submit that these unexpected fluid properties may result from the formation, at low bonding temperatures coupled with convective heat treatment, of unexpected strong contacts, or bonding points, between the unique fibers of the web. The uniqueness of the present invention was shown in the application at page 3, line 21 to page 4, line 3, and more specifically in Table 3. As shown in Table 3, control samples 1 and 2 showed the "expected" fluid properties. Sample 1 (a current surge material) had a high void volume of 26.0 cm^3/g, with a corresponding high permeability of 2078 μm^2. Sample 2 (100% bicomponent PLA) had a low void volume of 14.3 cm^3/g and a low permeability of 402 μm^2. However, the present invention exhibited a higher void volume (31.6 cm^3/g) compared to sample 1, but unexpectedly, a much lower (by 41%) permeability of 1231 μm^2. Applicants respectfully submit that this evidence is sufficient to show that the claimed fluid properties are unexpected, unique results, and not an obvious modification of the Tsai '322 reference, in view of the Tsai '694 reference.

For at least the reasons given above, Applicants respectfully submit that Claim 1 is allowable over the art of record. Furthermore, since Claims 2-15 and 17-22 recite additional

claim features, and depend directly or indirectly from Claim 1, these claims are also allowable over the art of record. Claim 23 has been cancelled, rendering its rejection moot. Accordingly, Applicants respectfully request the withdrawal of this rejection.

Claims 1-15 and 17-23 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Tsai '322, in view of EP 0801172 to Takeda et al. (hereafter "Takeda"), and the Handbook of Technical Textiles (hereinafter "HTT") or the Thermal Bonding of Nonwoven Fabrics (hereinafter "TBNF"). Applicants respectfully traverse this rejection for the following reasons.

Tsai '322, in view of Takeda, and either HTT or TBNF, does not teach or suggest a biodegradable nonwoven web comprising a first biodegradable binder fiber that does not undergo severe heat shrinkage, and a second biodegradable thermoplastic fiber, and wherein the web is thermally bonded at a temperature within about 20°C above the melting temperature of the first biodegradable binder fiber, using only convective heating, to achieve a moderate permeability and a high void volume.

Tsai '322 does not teach or suggest any web processing parameters. Applicants respectfully submit, that contrary to the Examiner's statement, Tsai '322 does not teach that its fibers can be bonded at a temperature below 145 degrees in Column 6, line 48. This reference teaches melting or softening temperatures of the first and second components, but does not teach or suggest bonding temperatures. Moreover, the bonding temperature of a fiber is not an inherent property of the fiber, since this temperature also depends on processing parameters independent of the melting point of the fiber. Applicants respectfully submit that at the time of Applicants' invention it would not have been obvious to bind fibers within 20°C degrees above the surface melting temperature of the binder fiber, because bonding at these low temperatures was not conventionally done, without the use of an additional bonding component, in order to achieve a thoroughly bonded web. In addition, the HTT and TBNF references provide only general statements regarding different bonding techniques. These references do not teach or suggest bonding using only convective heating at a temperature within 20°C degrees above the melting temperature of a binder fiber. The Examiner stated that "altering the bonding temperature also allows for optimization of the strength and disintegratability properties of the web." Applicants respectfully submit that the mere fact that cited art can be modified does not make the

modification obvious, unless the cited art teaches or suggest the desirability of the modification. *See In re Laskowski*, 871 F.2d 115, 117, 10 U.S.P.Q.2d 1397, 1398 (Fed. Cir. 1989). These references cited by the Examiner do not teach or suggest the desirability of bonding a web using convective heating at low temperatures without an additional bonding mechanism. Applicants also respectfully submit that Applicants' claimed permeability and void volume are not inherent in the combined teachings of Tsai '322 in view of Takeda and HTT, or in view of Takeda and TBNF, since none of these references teach or suggest Applicants' claimed materials and processing parameters.

For at least the reasons given above, Applicants respectfully submit that Claim 1 is allowable over the art of record. Furthermore, since Claims 2-15 and 17-22 recite additional claim features, and depend directly or indirectly from Claim 1, these claims are also allowable over the art of record. Claim 23 has been cancelled, rendering its rejection moot. Accordingly, Applicants respectfully request the withdrawal of this rejection.

Claims 1-15 and 17-23 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Takeda, in view of Tsai '322 and either HTT or TBNF. Applicants respectfully traverse this rejection for the reasons stated above. Applicants respectfully submit that Takeda in view of Tsai '322, and either HTT or TBNF, does not teach or suggest Applicants' claimed materials and processing parameters.

In addition, Applicants respectfully submit that Takeda teaches away from a biodegradable web with Applicants' claimed fluid properties. The Takeda reference is directed to water-disintegrable, biodegradable sheets. Takeda teaches sheets that disintegrate upon exposure to water. These sheets comprise at least a three component system which includes a biodegradable synthetic fiber, a natural fiber and a powder binder (see Abstract). The Takeda reference also uses very short fiber, around 5 mm in length, to aid in the solubility or disintegration of the sheets (see Examples). The powder binder is a necessary component in the Takeda sheets. This binder is water-soluble or water swellable, and is substantially lost upon exposure to water (see page 3, lines 54-56). This allows the fiber components in the sheets to instantly loosely separate upon exposure to water (see page 2, lines 55-59). If the Tsai '322 fibers are used in place of Takeda's biodegradable synthetic fiber, in the Takeda sheet,

Applicants' claimed web and fluid properties would not result. Upon application of an aqueous solution, the binder property in the sheet would be lost, causing the fibers to separate, and resulting in a lost of fluid properties, including a lost of void volume and a lost of permeability. In addition, the Takeda binder powder when heated softens, loses its shape and binds a lot of area on the sheet. This results in a tighter, more compact structure, which in turn, results in a sheet with a low void volume and low permeability.

For at least the reasons given above, Applicants respectfully submit that the Tsai '322 fibers in the Takeda sheets would not result in Applicants' claimed webs. Applicants respectfully submit that Claim 1 is allowable over the art of record. Furthermore, since Claims 2-15 and 17-22 recite additional claim features, and depend directly or indirectly from Claim 1, these claims are also allowable over the art of record. Claim 23 has been cancelled, rendering its rejection moot. Accordingly, Applicants respectfully request the withdrawal of this rejection.

Marked up version of re-written claims

Pursuant to 37 CFR §1.121(c)(1)(ii), another version of the rewritten claims marked up to show all the changes relative to the previous version of the claims is now set forth with deleted text shown in [brackets] and added text shown in underlining:

1. (Twice Amended) A biodegradable nonwoven web having a permeability within the range of about 500 to about 1500 μm^2 and a void volume that is greater than about 25 cm^3/gram, wherein the web comprises a first biodegradable binder fiber that does not undergo severe heat shrinkage and a second biodegradable thermoplastic fiber; and

wherein the biodegradable nonwoven web is thermally bonded at a temperature [less than 160°C] within about 20°C above the melting temperature of the first biodegradable binder fiber, using only convective heating[,] to thoroughly bind the web and to achieve the permeability and the void volume.

2. (Twice Amended) The nonwoven web of claim 1, wherein the first biodegradable binder fiber is a multicomponent fiber comprising a surface component and a non-surface component.

17. (Amended) The nonwoven web of claim 1, wherein the nonwoven web is thermally bonded at a temperature [less than 150°C] within about 10°C above the melting temperature of the first biodegradable binder fiber.

18. (Amended) The nonwoven web of claim 1, wherein the nonwoven web is thermally bonded at a temperature [less than 145°C] within about 5°C above the melting temperature of the first biodegradable binder fiber.

20. (Amended) The nonwoven web of claim 2, wherein the nonwoven web is thermally bonded at a temperature 10 to 15°C above the melting temperature of the surface component of the first biodegradable binder fiber.

21. (Amended) The nonwoven web of claim 2, wherein the nonwoven web is thermally bonded at a temperature 5 to 10°C above the melting temperature of the surface component of the first biodegradable binder fiber.

22. (Amended) The nonwoven web of claim 2, wherein the nonwoven web is thermally bonded at a temperature 2 to 5°C above the melting temperature of the surface component of the first biodegradable binder fiber.

New Claims 24-29 were added.

II. Conclusion:

The foregoing is submitted as a full and complete Response to the Office Action mailed October 4, 2002. For at least the reasons given above, Applicants respectfully submit that Claims 1-15 and 17-22, 24-29 define patentable subject matter. Accordingly, Applicants respectfully request allowance of these claims. Early and favorable consideration of the claims is requested.

A check in the amount of $110.00, is enclosed for the fee for a one-month extension of time. Also enclosed is a check in the amount of $156.00, the fee for one additional independent claim and four additional dependent claims. No additional fees are believed due; however, the Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, to Deposit Account No. 11-0855.

Should the Examiner believe that anything further is necessary in order to place the application in better condition for allowance, the Examiner is respectfully requested to contact Applicants' representative at the telephone number listed below.

Respectfully submitted,

By: Theodore M. Green
Reg. No. 41,801

KILPATRICK STOCKTON, LLP
Suite 2800
1100 Peachtree Street
Atlanta, Georgia 30309-4530
404/815-6500
Attorney Docket No. 44040-228238
Attorney File No. 11302-0530
K-C No. 14,747